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worked out—then I am willing to say, This is the behavior of the passive thinker that I mean by his thought. I should begin by looking for such movements of atoms as actually moved too slightly for us to notice it—the organs of expression, the tongue, principally, and the eyes. Or perhaps I should find part of the movements to be of this nature, part of them such as strained the muscles that inhibited such expression. Either would be the first step toward a teleological interpretation of a mechanical event. But of these details I am not sure. To find just what that behavior is which others call the criterion of mind and which I call mind is a problem of long and careful analysis. For this analysis we must turn to the psychologist, and, above all, I have recently come to hope, to the comparative psychologist. Yet even this hope must learn to be patient. When one passes beyond new observations to look for new interpretations one finds the shadow of the eject clouding fresh fields.

''Bien entendu,'' writes Georges Bohn in a chapter discussing the ''criteria of psychism''[3]—''bien entendu, je ne parlerai pas ici de la conscience des animaux. Je ne la nie pas, mais je ne peux rien savoir à son égard. Je parlerai de psychisme, ce mot designant la complexité de phénomènes que je parviens à analyser plus ou moins.''

I can not think a metaphysics useless that might prevent a writer of the keen intelligence of M. Bohn from perverting his own sense of what words should mean to the use of those whom he occasionally refers to as ''metaphysicians.'' In science as elsewhere it is not a bad thing to have one's courage with one, and a very little, I should think, would suffice to ''deny'' what one ''will not speak of''—what one can not speak of for the simple reason that one can know nothing about it. Isn't it saner to seek the meaning of consciousness itself among ''the phenomena one can more or less analyze''?

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REVIEWS AND ABSTRACTS OF LITERATURE

Elements of Physiological Psychology. GEORGE TRUMBULL LADD and ROBERT SESSIONS WOODWORTH. New York: Charles Scribner's Sons. 1911. Pp. xix + 704.

The " Elements " has served a generation of psychological students as a storehouse of information, covering not only the phenomena of nervous structure and function in their relation to the processes of consciousness, but practically the whole domain upon which experimental psychology had entered at the time of its publication, embracing all the orders of sensation, perception of objects, the time-relations of mental phenomena, emotional states, the system of expressive reactions, and reproductive processes. If the great extension of research, not only into new fields, but also within each individual group of problems, be kept in mind, it is high praise to say that the new edition has fully maintained the standard of comprehensiveness and exactness by which the work was originally marked.

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[3] ''Naissance de l'Intelligence,'' p. 111.

What this extension means in mere bulk and in the tax it imposes on the authors, in making the work representative of the status of research throughout the field discussed, may be inferred from a comparison of the number of sources cited in the two editions, respectively. In the old, there were some hundred and fifty, all told; in the new, considerably over five hundred, or well on for four times as many, appear. The increase in number of individual citations in the new edition is even greater than is indicated by a comparison of authors, for while in the original edition only one fourth of the names occurred more than once, repeated citations in the present mark nearly one half the names.

Yet the bulk and weight of the volume have not been increased. The numbered pages of text in the new edition are less by one than in the old; and while the total number in the revised edition is greater by some half dozen pages, the use of a thinner, but tougher and more flexible, paper has slightly decreased the thickness of the volume. At the same time, nothing has been sacrificed in the way of topographical excellence. The paper is solidly opaque and white, the type large and clear. The pages, also, are of the same size as in the original and the number of lines to a page remains unchanged.

The subject-index of the new edition shows an enlargement even greater than that which marks the list of authors, increasing from about one hundred and forty titles to almost eight hundred, or nearly six times. When it is recalled that not only has the general product of experimental research during the last quarter of a century been added to the matter contained in the original edition, but that wholly new chapters have been introduced, such as the discussion of the process of learning and of the place of the nervous system in the animal kingdom, the successful confinement of bulk within the limits of an easily handled volume is the more remarkable. This has been accomplished in two ways. The more obvious of these is the omission of certain chapters of a more theoretical or speculative character which leaves the empirical summation unaffected. The more important modification in this regard, however, is the painstaking economy of statement which is maintained throughout the work. How much has been done in this way, even in those parts which have undergone the least material changes or additions, can be appreciated only by a careful comparative reading of the two editions, chapter by chapter. The whole work is a close-packed compendium of research which represents nothing less than the history of physiological psychology during the past twenty-five years, the first generation of its continuous and general activity.

What that period of time has meant in the history of experimental psychology in America, in its bearing both upon the general extension of interest in the study and in the development of the technical means of research, is indicated by a comparison of the place which American titles hold in the two editions. In the original work a half dozen such names occur, or one in twenty-five; in the present edition there are, roughly, six times that number, or nearly one fourth the total. Even allowing for greater completeness in the review of American literature, this change of relative position is impressive. Nor is the advance restricted to any individual province; it appears in the comparative study of organic types, in physiological research, and in the field of exceptional and pathological phenomena as well as in the study of normal processes in the human subject.

The general arrangement of the original edition is retained without change. The summary of psychological data is supplemented by a description of the physical basis of mental activities and by a discussion of the theoretical relations which exist between the two systems of phenomena. The work thus comprises three general divisions: first, a detailed account of the structure and functions of the nervous system; secondly, the presentation of the qualitative, quantitative, and temporal correlations of nervous and mental activities; and lastly, a consideration of the nature of mind in the light of the preceding discussion.

The first part presents two departures from the first edition, apart from the many internal modifications and additions by which it is marked. The one departure consists in a transference of the two chapters on cerebral functions from their original place in the second part to the close of part one. The change brings these chapters at last into a proper relation with the discussion of the mechanics and activities of the nervous system, to which the first part of the work is devoted. The second departure appears in the introduction of a prefatory chapter on the significance of the nervous system in the animal kingdom, in which the different organic types are characterized as well as the general functions of nervous elements, tissues, and systems pointed out. The chemistry of the nervous system is properly given a separate place (new ed., Chap. V.). It is not, however, the addition of a new discussion to the text, since the same problem is treated in the first chapter of the old edition ("The Elements of the Nervous System"). The subdivision was desirable, not only in view of the more substantial knowledge now possessed, but also on the ground of improvement in the logical scheme of treatment.

It seems to the reviewer scarcely correct to say in the preface to the new edition (p. vi) that "two entire chapters . . . have been added to part one," the second being chapter two (new ed.) on the "Development of the Nervous System in the Individual." The sixth chapter of the original edition entitled, "The Development of the Nervous Mechanism," is devoted to this question, and its account runs parallel to that of the new. What does mark the revision is the greatly increased precision with which the intimate process of development is traced. The author of the original edition, limited by the results of investigation at the time, was able to follow, by contrast, only the gross features of the process. In concluding the chapter he adds the words: "All the coarser differentiations of structure to which reference has thus far been made are only the expression—so to speak—of certain histogenetic changes which have been secretly taking place." These changes are now largely an open secret, and it is in the detailed description of the histological development of the nervous system that the new edition differs from the old, rather than in the introduction of an organic part of the discussion previously omitted.

The advance in histology is also reflected in the admirable and abundant illustration which accompanies this section of the new edition. It is shown, for example, in the description of the elements of the nervous system,[1] especially in the new series of cuts (Figs. 46–59). In the original edition there was not a single illustration of the minute geography of the nervous system and its elements which this series of figures represents in such variety and detail. The evidence of progress in this direction is not confined to a single chapter, but extends throughout the anatomical part of the work; compare, for example, as regards both text and illustration, the discussion of the microscopical structure of the cortical layers of the hemispheres. The full treatment of the nervous system from all standpoints—structural, functional, chemical, developmental, etc. —as an introduction to the psychological discussion of problems of psychophysiological interrelation gives the work an independent value for the medical physiologist and alienist which no description of the purely mental phenomena could possess. At the same time the "Elements" provides only the general basis for the work of physician and psychiatrist since its scope is restricted to the phenomena of normal psychophysiology, a limitation which is strictly adhered to even when it involves the exclusion of data repeatedly dealt with in psychological laboratories, such as the influence of drugs upon reaction times, expressive movement, and the perception of objects and space relations.

The second part of the work retains the arrangement of the original edition throughout. Its general subject is psychophysical correlation which is treated qualitatively in relation to three groups of mental phenomena—sensations, perceptions, and representations; quantitatively, in the discussion of the psychophysic law, so-called; and temporally, in the review of reaction time and its complications. Apart from the revision and supplementation which mark practically every page, this section of the work is notable chiefly for the new matter added in the later chapters, in which are summarized the experimental investigations of association and memory; of the nature and forms of learning, both in man and simpler organic types; and of the mechanism of thought processes, attention and its fluctuations, varied reactions, comparison, abstraction, and the forms of reasoning.

In this central division of the work, as well as in the first part, certain general features of the revision may be noted. First, of course, is the great addition to the mass of individual observations recorded, but this is only the beginning of what the new edition represents. Equally striking is the reinspection within each individual field which, through its determination of the more intimate nature of the processes involved, has resulted in many important changes in our conception of the phenomena —for instance, in the distribution of elements in the time-scheme of reactions, in eye-movements and the visual perception of objects and space relations, in the orientation of the body and its sensational basis, etc. A third feature is the application of experimental methods to a larger range of psychological problems which is illustrated in the study of learning and the acquisition of skill and in the analysis of thought processes through controlled introspection. A fourth phase may be added, namely, the endeavor, in both sections of the work, to bring together the results of investigation upon human subjects and various types lower in the organic series, in order to achieve a more adequate view of the forms of behavior and their systematic modifications. This last point of view, however, is not maintained throughout the work, but rather appears as a conception applied in connection with specific problems, such as the development of a nervous system in the organic kingdom and the comparison of processes of learning in man and brute.

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[1] Old Ed., Chap. I.; New Ed., Chap. IV.

In the third part, " The Nature of the Mind," the more theoretical or speculative problems concerning the relation of mind and body are discussed in later and earlier editions alike. To this section in the original plan should properly be assigned the last chapter of part two on " Certain Static Relations of the Body and Mental Phenomena." The five chapters, which this rearrangement gives, are reduced to two in the present edition; roughly, the discussion is cut down to one half its bulk. This modification is in service of the specific aim of the book, to confine attention as closely as possible to the summation of empirical investigations and the correlation of their results in descriptive and explanatory concepts. This reduction has made possible a very considerable addition to the facts discussed, without increasing the bulk of the volume.

Throughout the work the authors show an admirable common sense and succinctness of statement in their presentation of the multitude of facts with which, in its several parts, the work deals. In very many places a fine expository sense is necessary to set forth intelligibly the results of complicated investigations without that elaborate description of methods and instruments which the scope of the " Elements " makes impossible. In very many cases, also, a sustained critical judgment is essential to the appraisement of both methods of research and bearing of results upon debated theories. In all these ways the authors seem to have maintained an attitude for which they deserve the highest praise.

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Geschichte der Psychologie. OTTO KLEMM. (No. VIII. of the Series, " Wissenschaft und Hypothese.") Leipzig and Berlin: B. G. Teubner. 1911. Pp. 387.

A general history of psychology, not limited to one period (like the work of Siebeck), nor to one nation (like that of Dessoir), certainly